

### Claims

What is claimed is:

1. A system for accurately predicting payload performance at a location remote from an intended launch vehicle or its associated computer controls, comprising:
  - a.) A Mission Operations Tool for collecting information for payload operations products and support;
  - b.) A Command and Data Tool for creating command and data tables to facilitate communications with the Orbiter-in-a-Box;
  - c.) An Orbiter-in-a-Box Tool portable in nature and having an embedded real-time model of launch vehicle avionics capable of emulating the launch vehicle environment;
  - d.) A General Purpose Emulator enabling payload customers to create and test mathematical model of their payload capable of use in crew training and vehicle simulations on manned flights.
2. The system in claim 1 further comprising a Shared Data Repository wherein data for a plurality of payloads may be uploaded to a shared server to enable the launching agency to integrate such data into a model of all intended payloads for a particular flight.
3. A method for accurately predicting payload performance at a location remote from an intended launch vehicle or its associated computer controls, comprising:
  - a.) Distributing portable systems such as is described in claim 1 to payload customers;
  - b.) Allowing input from said customers concerning customer payload(s);
  - c.) Processing said data to form a data set capable of integration by a launching agency to form an accurate and integrated model of all intended payloads.